	A1	cao Must come from correct probability $\mathrm{P}(M=6)=\frac{99}{250}$ Do not allow $n \geqslant 6$

Question Number	Scheme	Marks
6(a)	$\frac{a+b}{2}=\frac{5a}{2}$	M1
	$b=4a$	A1
	$\left[\mathrm{P}(X>b-2a)\Rightarrow\right]\mathrm{P}(X>2a)=\frac{4a-2a}{4a-a}$ or $\mathrm{P}\left(X>\frac{b}{2}\right)=\frac{b-\frac{b}{2}}{b-\frac{b}{4}}$	M1
	$\frac{2}{3}$	A1
		(4)
(b)(i)	$\left[\mathrm{E}(Y^2)=\mathrm{Var}(Y)+\mathrm{E}\left(Y\right)^2=\right]\frac{(c-3)^2}{12}+\left(\frac{3+c}{2}\right)^2=549$	M1
	$c^2+3c-1638=0$ oe	M1
	$c=39$	A1
		(3)
(ii)	$\left[\mathrm{P}\left(4Y-14<\frac{17-Y}{2}\right)\Rightarrow\right]\mathrm{P}\left(Y<5\right)$	M1
	$\frac{5-3}{"39"-3}$	M1
	$\frac{1}{18}$	A1
		(3)

	Notes	**Total 10**
(a)	**M1**	For use of $\frac{a+b}{2}$ to set up an equation in terms of a and b
	A1	oe e.g. $a=\frac{b}{4}$
	M1	For a correct expression for $\mathrm{P}(X>b-2a)$ their a or their b provided this leads to a probability Allow use of integration $\int_{2a}^{4a}\frac{1}{4a-a}\,\mathrm{d}x$ or $\int_{\frac{b}{2}}^{b}\frac{1}{b-\frac{1}{4}}\,\mathrm{d}x$
	A1	oe
(b)	**M1**	For use of $\mathrm{Var}(Y)+\mathrm{E}\left(Y\right)^2=549$ Allow use of correct integration with limits substituted for this mark $\int_{3}^{c}\frac{1}{c-3}y^2\,\mathrm{d}y=549\Rightarrow\frac{1}{c-3}\left(\frac{c^3-3^3}{3}\right)=549$
	M1	For a correct 3TQ oe or a correct cubic $c^3-1647c+4914=0$ oe
	A1	cao if other root(s) shown then they must be rejected. Do not allow awrt 39
(ii)	**M1**	For $\mathrm{P}\left(Y<5\right)$ allow $Y<5$ for this mark
	M1	For use of $\frac{5-3}{"c"-3}$